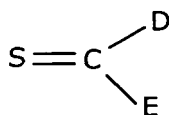


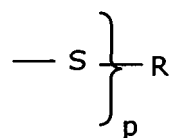
**IN THE CLAIMS:**

1-40. (cancelled)

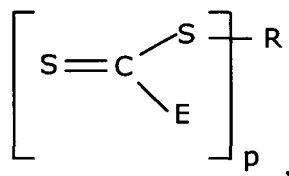
41. (new) A process for producing a polymer, said process comprising polymerizing a monomer mix into said polymer in the presence of a source of free radicals and a chain transfer agent having a transfer constant in the range of from 0.1 to 5000, said monomer mix comprising (meth)acrylates, styrene and said chain transfer agent having the following formula:



wherein when D is D2 of the following formula:



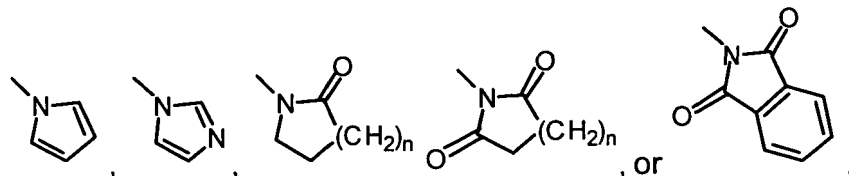
then p is in the range of from 1 to 200, E is E1 and said transfer agent is of the following formula:



where in all of the above:

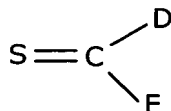
R is a p-valent moiety derived from a moiety selected from the group consisting of substituted or unsubstituted alkane, substituted or unsubstituted alkene, substituted or unsubstituted arene, unsaturated or aromatic carbocyclic ring, unsaturated or saturated heterocyclic ring, an organometallic species, and a polymer chain, R• being a free radical leaving group resulting from R that initiates free radical polymerization; and

E1 is:

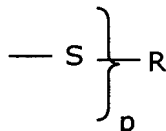


42. (new) A composition comprising a polymer prepared by the process of claim 41.

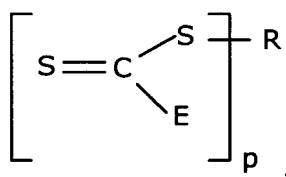
43. (new) A process for producing a polymer, said process comprising polymerizing a monomer mix into said polymer in the presence of a source of free radicals and a chain transfer agent having a transfer constant in the range of from 0.1 to 5000, said monomer mix comprising acrylates and said chain transfer agent having the following formula:



wherein when D is D2 of the following formula:



then p is in the range of from 1 to 200, E is E2 and said transfer agent is of the following formula:



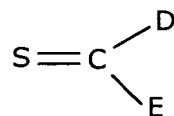
where in all of the above:

R is a p-valent moiety derived from a moiety selected from the group consisting of substituted or unsubstituted alkane, substituted or unsubstituted alkene, substituted or unsubstituted arene, unsaturated or aromatic carbocyclic ring, unsaturated or saturated heterocyclic ring, an organometallic species, and a polymer chain, R• being a free radical leaving group resulting from R that initiates free radical polymerization; and

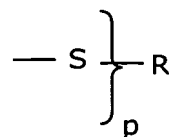
E2 is -OEt, -OC<sub>6</sub>H<sub>5</sub> or C<sub>6</sub>F<sub>5</sub>.

44. (new) A composition comprising a polymer prepared by the process of claim 43.

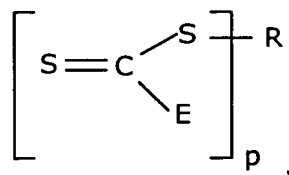
45. (new) A process for producing a polymer, said process comprising polymerizing a monomer mix into said polymer in the presence of a source of free radicals and a chain transfer agent having a transfer constant in the range of from 0.1 to 5000, said monomer mix comprising vinyl monomers and said chain transfer agent having the following formula:



wherein when D is D2 of the following formula:

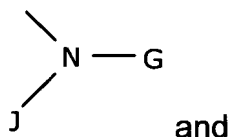


then p is in the range of from 1 to 200, E is E1 or E2 and said transfer agent is of the following formula:

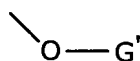


R is a p-valent moiety derived from a moiety selected from the group consisting of substituted or unsubstituted alkane, substituted or unsubstituted alkene, substituted or unsubstituted arene, unsaturated or aromatic carbocyclic ring, unsaturated or saturated heterocyclic ring, an organometallic species, and a polymer chain, R• being a free radical leaving group resulting from R that initiates free radical polymerization;

E1 is of the following formula:



E2 is of the following formula:

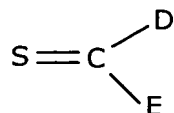


wherein G, J, and G' are independently selected from the group consisting of substituted or unsubstituted alkyl, substituted or unsubstituted alkylene, substituted or unsubstituted aryl, substituted or unsubstituted heterocyclyl, and when E = E1, G-N-J forms part of a non-aromatic cyclic group.

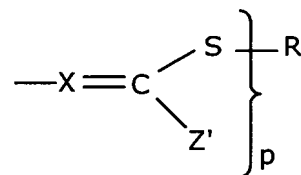
46. (new) The process of claim 45 wherein said vinyl monomers comprise vinyl acetate, vinyl butyrate, vinyl benzoate, vinyl chloride, vinyl bromide, vinyl fluoride, N-vinylpyrrolidone, N-vinylcarbazole, or a combination thereof.

47. (new) A composition comprising a polymer prepared by the process of claim 45 or 46.

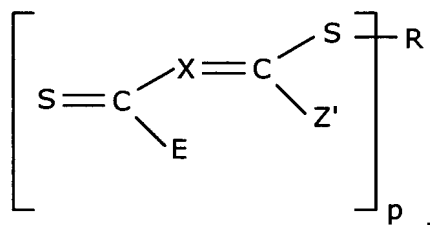
48. (new) A process for producing a polymer, said process comprising polymerizing a monomer mix into said polymer in the presence of a source of free radicals and a chain transfer agent having a transfer constant in the range of from 0.1 to 5000, said monomer mix comprising styrene, methacrylates and said chain transfer agent having the following formula:



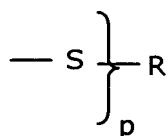
wherein when D is D1 of the following formula:



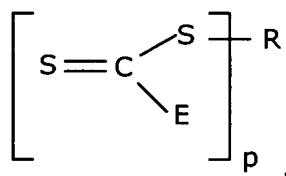
then p is in the range of from 1 to 200, E is Z' and said transfer agent is of the following formula:



wherein when D is D2 of the following formula:



then p is in the range of from 1 to 200, E is E1 or E2 and said transfer agent is of the following formula:



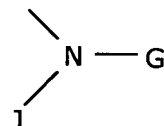
where in all of the above:

R is a p-valent moiety derived from a moiety selected from the group consisting of  $(-\text{CR}'''\text{Ph})$  and  $(-\text{CR}'''\text{CN})$ ,  $\text{R}^\bullet$  being a free radical leaving group resulting from R that initiates free radical polymerization and  $\text{R}'''$  being independently selected from the group consisting of hydrogen and substituted alkyl;

X is selected from the group consisting of a substituted or unsubstituted methine, nitrogen, and a conjugating group;

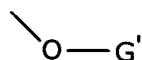
Z' is selected from the group consisting of E1, E2, halogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted aryl, substituted or unsubstituted heterocyclyl, substituted or unsubstituted alkylthio, substituted or unsubstituted alkoxycarbonyl, substituted or unsubstituted -COOR", carboxy, substituted or unsubstituted -CONR"2, cyano, -P(=O)(OR")2, -P(=O)R"2; wherein R" is selected from the group consisting of substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted aryl, substituted or unsubstituted heterocyclyl, substituted or unsubstituted aralkyl, substituted or unsubstituted alkaryl, and a combination thereof;

E1 is a substituent functionality derived from a substituted or unsubstituted heterocycle attached via a nitrogen atom or is of the following formula:



wherein G and J are independently selected from the group consisting of hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted acyl, substituted or unsubstituted aroyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkylsulfonyl, substituted or unsubstituted alkylsulfinyl, substituted or unsubstituted alkylphosphonyl, substituted or unsubstituted arylsulfonyl, substituted or unsubstituted arylsulfinyl, substituted or unsubstituted arylphosphonyl; and

E2 is of the following formula:



wherein G' is selected from the group consisting of substituted or unsubstituted alkenyl, substituted or unsubstituted aryl.

49. (new) The process of claim 48 wherein said monomer mixtures comprises styrene.

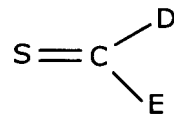
50. (new) The process of claim 49 wherein R is selected from the group consisting of benzyl, 1-phenylethyl, 2-phenylpropyl, 2-(alkoxycarbonyl)prop-2-yl, 2-cyanoprop-2-yl, 2-cyanobut-2-yl, and 1-cyanocyclohexyl.

51. (new) The process of claim 48 wherein said monomer mixtures comprises methyl methacrylate.

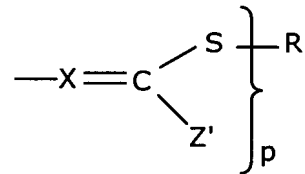
52. (new) The process of claim 49 wherein R is selected from the group consisting of 2-phenylpropyl, 2-cyanoprop-2-yl, 2-cyanobut-2-yl, and 1-cyanocyclohexyl.

53. (new) A composition comprising a polymer prepared by the process of claim 48, 49, 50, 51 or 52.

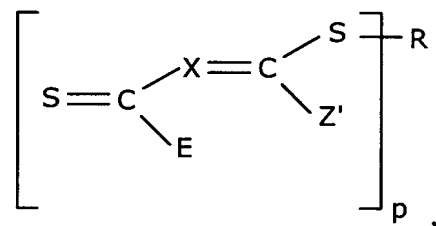
54. (new) A process for producing a polymer, said process comprising polymerizing a monomer mix into said polymer in the presence of a source of free radicals and a chain transfer agent having a transfer constant in the range of from 0.1 to 5000, said monomer mix comprising vinyl acetate and said chain transfer agent having the following formula:



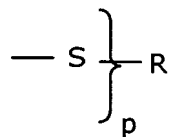
wherein when D is D1 of the following formula:



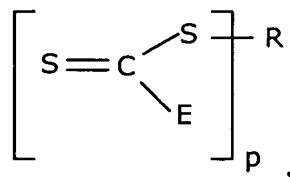
then p is in the range of from 1 to 200, E is Z' and said transfer agent is of the following formula:



wherein when D is D2 of the following formula:



then p is in the range of from 1 to 200, E is E1 or E2 and said transfer agent is of the following formula:



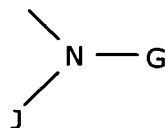
where in all of the above:

R is a p-valent moiety derived from a moiety selected from the group consisting of  $(-\text{CR}'''\text{CN})$  and  $(-\text{CR}'''\text{CO}_2\text{Alkyl})$ ,  $\text{R}^\bullet$  being a free radical leaving group resulting from R that initiates free radical polymerization and  $\text{R}'''$  being independently selected from the group consisting of hydrogen and substituted alkyl;

X is selected from the group consisting of a substituted or unsubstituted methine, nitrogen, and a conjugating group;

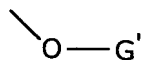
Z' is selected from the group consisting of E1, E2, halogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted aryl, substituted or unsubstituted heterocyclyl, substituted or unsubstituted alkylthio, substituted or unsubstituted alkoxy carbonyl, substituted or unsubstituted  $-\text{COOR}''$ , carboxy, substituted or unsubstituted  $-\text{CONR}''_2$ , cyano,  $-\text{P}(=\text{O})(\text{OR}'')_2$ ,  $-\text{P}(=\text{O})\text{R}''_2$ ; wherein  $\text{R}''$  is selected from the group consisting of substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted aryl, substituted or unsubstituted heterocyclyl, substituted or unsubstituted aralkyl, substituted or unsubstituted alkaryl, and a combination thereof;

E1 is a substituent functionality derived from a substituted or unsubstituted heterocycle attached via a nitrogen atom or is of the following formula:



wherein G and J are independently selected from the group consisting of hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted acyl, substituted or unsubstituted aroyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkylsulfonyl, substituted or unsubstituted alkylsulfinyl, substituted or unsubstituted alkylphosphonyl, substituted or unsubstituted arylsulfonyl, substituted or unsubstituted arylsulfinyl, substituted or unsubstituted arylphosphonyl; and

E2 is of the following formula:



wherein G' is selected from the group consisting of substituted or unsubstituted alkenyl, substituted or unsubstituted aryl.

55. (new) A composition comprising a polymer prepared by the process of claim 54.